

WHAT IS CLAIMED IS:

1                   1.     A small footprint semiconductor device package comprising:  
2                   a plastic package body for enclosing a die, the plastic package body including  
3 a top coupled to a bottom through a plurality of sides;  
4                   a lead including an enclosed portion by the package body and in electrical  
5 communication with the die, and an exposed portion of the lead extending from the side of  
6 the package body, folding back along the side of the package toward the bottom of the  
7 package at a first angle, and folding toward a center of the bottom of the package to form a  
8 lead foot, whereupon the portion of the lead along the side of the package and the portion of  
9 the lead along the bottom of the package form an angle of less than 90° from each other and  
10 the lead foot being inclined at a second angle relative to an underlying planar PC board to  
11 promote solder wetting.

1                   2.     The package of claim 1 wherein the die is one of a power device, a  
2 discrete device, and an integrated circuit.

1                   3.     The package of claim 1 wherein the lead forms a reverse gull wing  
2 shape.

1                   4.     The package of claim 1 wherein the package has a reduced package  
2 profile including the lead..

1                   5.     The package of claim 1 wherein the lead foot is inclined at the second  
2 angle between 1° and 7° relative to the planar PC board.

1                   6.     The package of claim 1 wherein the package body further comprises a  
2 notch configured to receive a portion of the lead foot, thereby permitting the lead foot to be  
3 partially recessed within the package body in order to reduce a height of the package.

1                   7.     The package of claim 1 wherein the notch includes a depth of about  
2 two-thirds a thickness of the lead .

1                   8.     A small footprint semiconductor device package comprising:  
2 a package body enclosing a die having an area; and  
3 a lead including an enclosed portion enclosed by the package body and in  
4 electrical communication with the die, and an exposed portion of the lead extending from the

5 side of the package body and folding back along the side of the package toward the bottom of  
6 the package, and folding toward a center of the bottom of the package to form a lead foot, a  
7 combined width and length of the package body and the exposed lead portion defining a  
8 lateral footprint area, such that the die area occupies 40% or more of the footprint area .

1 9. The package of claim 8 wherein the exposed portion of the lead folds  
2 toward a center of the bottom of the package to form a rounded lead foot exhibiting a  
3 clearance from an underlying PC board defined by a radius of curvature of the foot.

1 10. The package of claim 8 wherein the exposed portion of the lead folds  
2 toward a center of the bottom of the package to form a linear lead foot inclined at a second  
3 angle relative to an underlying PC board.

1 11. The package of claim 10 wherein the package body exhibits a  
2 thickness 90% or greater than a vertical profile of the package.

1 12. A small footprint semiconductor device package comprising:  
2 a package body enclosing a die having an area; and  
3 a lead including,

4 an enclosed portion by the package body, the enclosed portion integral  
5 with a die pad supporting the die, the enclosed portion in electrical  
6 communication with the die, and

7 an exposed portion of the lead extending from the side of the package  
8 body, folding back along the side of the package toward the bottom of the  
9 package, and folding toward a center of the bottom of the package to form a  
10 lead foot; a combined width and length of the package body and the exposed  
11 lead portion defining a lateral footprint area,  
12 such that the die area occupies about 40% or more of the footprint area and the enclosed lead  
13 portion draws heat away from the operating die to the exposed lead portion, with the exposed  
14 lead portion dissipating the heat.

1 13. A small footprint semiconductor device package comprising:  
2 a plastic package body for enclosing a die having a thickness, the plastic  
3 package body including a top coupled to a bottom through a plurality of sides;  
4 a lead including an enclosed portion by the package body and in electrical  
5 communication with the die, an exposed portion of the lead extending from the side of the

6 package body, folding back along the side of the package toward the bottom of the package at  
7 a first angle relative to a plane of the package, and folding toward a center of the bottom of  
8 the package to form a linear lead foot inclined at a second angle relative to an underlying PC  
9 board; and

10 a recess formed in a side of the package body and receiving an end of the lead  
11 foot.

1 14. A small footprint semiconductor device package comprising:  
2 a plastic package body for enclosing a die having a thickness, the plastic  
3 package body including a top coupled to a bottom through a plurality of sides; and  
4 a lead including an exposed portion of the lead extending from the side of the  
5 package body, the exposed portion folding back along the side of the package toward the  
6 bottom of the package at a first angle relative to a plane of the package, and folding toward a  
7 center of the bottom of the package to form a substantially straight lead foot inclined at a  
8 second angle relative to a trace on an underlying PC board, an adhesion of the lead foot to the  
9 solder enhanced by the second angle.

1 15. A small footprint semiconductor device package comprising:  
2 a plastic package body for enclosing a die, the plastic package body including  
3 a top coupled to a bottom through a plurality of sides;  
4 a lead including an enclosed portion by the package body and in electrical  
5 communication with the die, and an exposed portion of the lead extending from the side of  
6 the package body parallel to a plane of the package body, folding back along the side of the  
7 package toward the bottom of the package at a first angle of greater than 90° relative to the  
8 plane of the package body, and folding toward a center of the bottom of the package to form  
9 a linear lead foot, whereupon the lead foot is inclined at a second angle relative to an  
10 underlying planar PC board to promote solder wetting.